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THE IMPACT OF THE COMPREHENSIVE TEST BAN TREATY ON NUCLEAR NON-PROLIFERATION AND AMERICAN SECURITY

by

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Contents

Page

Preface

The Comprehensive Test Ban Treaty has been under negotiation my entire life. I found myself intrigued by American idealism and optimism about this treaty during a time when America's nuclear arsenal was growing at a terrific pace. My desire to understand the impact of the treaty intensified after the recent nuclear testing conducted by India and Pakistan. The information presented here is intended to provide an impartial understanding of the issues so that a person interested in the treaty can grasp the significant concepts easily and draw their own conclusion.

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Abstract

This paper attempts to discern what the real impact of the Comprehensive Test Ban Treaty will be to nuclear non-proliferation, and American security by examining the arguments in support of ratification and against ratification, idealist and realist views (respectively). India and Pakistan's recent proliferation is discussed in light of the limitations of verification and diplomatic influence. The paper concludes with analyses of the two sides (pro and con) and what the author believes will be a positive impact on non-proliferation, and American security and leadership in the next millennium, from the CTBT's ratification.

Idealists believe the CTBT is the next logical step towards total nuclear disarmament and essential to preserve the momentum established by the Non-Proliferation Treaty. Idealists rightfully argue that America's position and moral leadership are at stake if the United States does not lead the path towards a nuclear free world. Realists are not convinced the treaty will prevent a rogue nation from acquiring crude nuclear weapons (horizontal proliferation), are deeply concerned about the effect no testing will have on the safety and security of America's nuclear arsenal, and complain bitterly about the issues of verification and modernization. The political solution for the current Administration was the creation of the Stockpile Stewardship and Management Program (SSMP). The SSMP will allow exploitation of the loopholes in the treaty through sub-critical experiments and billion dollar computers that no other country currently

possesses. Proponents argue the United States could effectively maintain the safety and reliability of its arsenal, while leading the other nation's march towards disarmament.

Methodology for this report was based on unclassified documents and on-line research tools.

Chapter 1

Introduction

So in the Libyan fable it is told, that Once an Eagle stricken with a dart, said when he saw the fashion of the shaft, "with our own feathers, not by others hands, are we now smitten."

—Aeschlyus

The Comprehensive Test Ban Treaty (CTBT) sits quietly before the United States Senate awaiting its opportunity for ratification so that the United States may become the 11th nation of forty-four required for its global entry into force. Never has a nation worked so hard for, in theory, and so diligently against, in practice, an international treaty. Thirty-six years ago, and just five months before his assassination, President Kennedy became the first American president to call for a comprehensive ban on nuclear testing[1]. In the days of the cold war a comprehensive test ban seemed the world's only hope to step back from continued proliferation and nuclear holocaust. Still, as the dangers of nuclear war became more pronounced, the arms race continued its feverish pace unabated, as if somehow immune from the impending disaster. Nuclear deterrence became both an art form and insurance policy. Sophisticated weapons promising greater and more accurate destruction rolled off the superpower shelves. The difficulty of achieving consensus for such a broad and enduring purpose as a comprehensive test ban was difficult at best. Other treaties with similar goals lay languishing under the heat of discriminated opposition. Both advocates and opponents have written so much about the

Comprehensive Test Ban Treaty (CTBT) it is difficult to discern what the real effect of the treaty would be on non-proliferation and American security. Most discussions on the CTBT involve global security, but to the extent the United States must ratify and comply in order for the global effect to occur, it is important to examine what the sacrifices and benefits are to American national security first. The CTBT is not a panacea for global security, nor does it spell certain disaster for the safety of American nuclear weapons. Interestingly, the treaty bans "nuclear testing" without defining the term.[2] This paper will present the main arguments in support of and in opposition to the CTBT as they effect nuclear non-proliferation and American security. Discussion of the recent nuclear testing by India and Pakistan is offered as a case study on proliferation and the possible effect of the CTBT, before concluding with the author's belief on the real impact of the Comprehensive Test Ban Treaty to nuclear non-proliferation and American security. This paper will not discuss the technical aspects of nuclear weapons as they are inferred in the CTBT. The broadly accepted definitions of vertical proliferation being indicative of the growth and increased sophistication of the nuclear weapon states arsenals, and horizontal proliferation referring to the acquisition of any type of nuclear weapon by non-nuclear nations, will be used.

Notes

[1] "Can Comprehensive Test Ban treaty Put Nuclear Genie Back in Bottle?", Chuck McCutcheon, *CQ Weekly*, 4 July, 1998, pg. 1839

[2] "Science Group attacks Fusion Research efforts", *Chronicle of Higher Education*, 24 July 98, pg. A25

Chapter 2

Genesis of the CTBT: Nuclear Non-Proliferation in the Atomic Age

> *My fellow Americans let us take that first step. Let us, if we can, step back from the shadows of war and seek out the way of peace. And if that journey is a thousand miles, or even more, let history record that we, in this land, at this time, took the first step.*
>
> President John F. Kennedy, 1963

Nuclear non-proliferation efforts have been woven into the long road of Arms Control since the very beginning of the atomic age. Scientist's first and then activists of every race, religion and creed have been patiently calling for the end of nuclear weapons testing and development. Only twice in history have nuclear weapons been used. Ironically, they were weapons built without the benefit of testing. Over two thousand nuclear tests have occurred since the advent of the atomic age.[1] Idealists have coveted the idea of a global test ban treaty since the call for one came from Prime Minister Nehru of India in 1954. Sadly, it was the nation of India's nuclear tests in May of 1998 that rekindled the threat of nuclear proliferation and war. The complexities of the post cold war era have changed the arms control environment forever. Under the Warsaw Pact and NATO alliances there existed a nuclear umbrella that new emerging nations no longer enjoy. Consensus among non-nuclear nations has become even more important then the ambition of the nuclear weapon states, as concern for vertical proliferation diminishes

and horizontal proliferation renews its itself as a threat to peace. This chapter will review the main arguments presented in support of the CTBT including the following: the CTBT's relationship to the Non-Proliferation Treaty (NPT), its effect on non-proliferation, the challenges of verification, maintenance and modernization of the nuclear stockpile, and finally the CTBT's impact to American leadership in the next millennium.

Historical Perspective and Relationship to the Non-Proliferation Treaty

Beginning with the Limited Test Ban Treaty signed in 1963 banning all atmospheric, space and under water testing and continuing with the Non-Proliferation Treaty (NPT) of 1968, testing and proliferation began their evolutionary journey towards a comprehensive test ban. The Threshold Test Ban Treaty and Peaceful Nuclear Explosion Treaty (1974 and 1976 respectively) which prohibit all testing above a threshold of 150 Kilotons of TNT, lowered the threshold for underground testing but did not prohibit it.[2] The discriminatory nature of the NPT, allowing established nuclear weapon states to continue testing while prohibiting all other signatory nations from testing, and the lack of progress towards real nuclear disarmament, as envisioned in Article VI of the NPT, was the motivating factor for progress on the Comprehensive Test Ban Treaty (CTBT).[3] The dissatisfaction of non-nuclear member nations of the NPT towards the nuclear weapon states was manifested in the conference agreement to extend the NPT only if a universal comprehensive test ban was signed by the end of 1996.[4] As Dr. Lawrence Scheinman, Assistant Director of the United States Arms Control and Disarmament Agency, writes, "The relationship between a comprehensive test ban and the Nuclear Non-Proliferation Treaty (NPT) of 1968 is both straightforward and incontrovertible. Achievement of a

treaty banning all tests has been a central tenet of the NPT since its inception. That linkage is spelled out in the pre-amble of the NPT which recalls "The determination expressed by the parties to the 1963 treaty banning nuclear weapon tests in the atmosphere, in outer space, and under water…to seek to achieve the discontinuance of all test explosions of nuclear weapons for all times and to continue negotiations to this end."[5] In a very real sense the CTBT is an extension of and integral to the NPT. As Mr. Richard Garwin, noted arms control commentator, explain, "There seems no way in which one of the nuclear weapon states could continue to test without provoking the others to do the same, and thereby imperil the NPT regime."[6] Since the CTBT contains no additional provisions for those nations already committed to the NPT; there is broad consensus among non-nuclear NPT signatory nations for passage of the CTBT to constrain the nuclear weapon states.[7] It was no surprise to any of the proponents of the CTBT that President Clinton, upon submitting the treaty to the Senate for ratification called it "the longest-sought, hardest-fought prize in the history of arms control."[8] The United States had no choice but to commit to a comprehensive test ban if it was to get an extension to and possible permanence for the NPT.[9] The need for a CTBT, many proponents argue, has never been greater. Historical progress and the treaty's relationship to the NPT gives momentum to advocates of the CTBT. Idealists counter concerns of testing, verification and modernization with their own scientific evidence and belief.

Effect on Non-Proliferation and Verification

The CTBT effect on non-proliferation will be dramatic proponents argue, primarily because as sophisticated as simulation may be, testing will always be required to ensure

the reliability and safety of a new design. As Mr. Richard Garwin points out: "The CTBT will greatly impede qualitative vertical proliferation, that is the introduction of new types of thermonuclear weapons or weapons using significantly modified designs into the arsenals of the nuclear weapon states because of the inherent uncertainty in new untested designs makes them poor substitutes for existing types in which there is high confidence."[10] In addition, advocates of the treaty argue that while testing may not be required for first generation weapons, constraints on these nations will come in other forms, as Dr. Keeny again explains: "When the CTBT enters into force with essentially world-wide support including the world's five nuclear powers, an international legal norm against testing will have been established. While this could not prevent testing by a rogue state, the act of testing would, by violating a universal norm, put that state at odds with the entire international community and make it a prime candidate for international sanctions."[11] The implication is that economic and diplomatic sanctions will keep any nation not bound by the treaty in line with it. Testing which is barred by the treaty, will have much more of an effect on the development of new weapons than it would on the maintenance of old ones as Richard Soll argues in *Arms Control Today*, "While the role of nuclear test explosions in developing new, increased performance designs is essential, it is less important in maintaining the status quo, which includes refurbishing, rebuilding, or remanufacturing existing weapons as necessary, or making necessary modifications to improve their safety, reliability and effectiveness."[12] If elimination of testing can help constrain development of new systems, how does the treaty ensure verification that nations are complying?

The system of global monitoring envisioned by the CTBT is a mammoth undertaking of sensitive seismometers and communication equipment, very little of which exists today. Lawrence Livermore's forensic seismology team believes the new system "consisting of 170 seismic stations, 60 infrasound stations to record low frequency sound waves in the air, 11 hydroacoustic stations to record underwater sound waves, and 80 radionuclide stations to record airborne radioactive gases or particles"[13] will be up to the task. The challenge of verifying a zero threshold treaty is one that draws consistent criticism since as John Zucca, director of Livermore's treaty verification division points out, "the number of natural events that could be mistaken for violations becomes immense…for example, more than 200,000 earthquakes similar in seismic magnitude to a small nuclear explosion occur in the world every year. Many of these background events can be disregarded because of their depth and similarity to other events known to be non-nuclear, but many will not be identified so easily."[14] The fall back for this system is on-site investigation and national intelligence systems that will help complete the verification picture. The bottomline is that advocates of the new system believe treaty verification is achievable under the CTBT.

Maintenance and Modernization under the CTBT

Proponents of the CTBT believe it will not affect the maintenance and modernization of the American arsenal. Initially, backers of the CTBT believed the position of no testing was salable enough, but after the almost categorical rejection of the majority of scientists in the field, a political compromise was developed in the form of the Stockpile Stewardship and Management Program (SSMP). Administration advocates of the compromise walk a fine line between honoring the spirit of the CTBT and limiting the

scope of the SSMP which scientists and national labs consider so important to maintaining nuclear safety and reliability. Dr Ferderber of Lawrence Livermore National Laboratory explains: "The key thrust of the Stockpile Stewardship part of the program is to replace the brute force and the empiracy of nuclear testing with a better scientific understanding of the fundamentals of nuclear weapon performance. The central technological feature of the stewardship is advanced computations and modeling of the individual and integrated processes involved in a nuclear explosion so as to provide a reliable predictive capability of a nuclear weapons performance. This requires modeling processes from the initial high-explosive detonation through the fission and fusion processes in the nuclear explosion in a manner that can address the issues of nuclear safety, weapon reliability and overall performance."[15] Simply translated American national weapons laboratories will receive of billions of dollars in funding to create and maintain facilities that can help offset the scientific impact of a moratorium on testing. The President's goals via the Department of Defense Nuclear Posture Review and priorities established for the safety of the nuclear deterrent clearly indicate a desire to maintain the capability of the United States' nuclear arsenal without testing. With five new facilities and over 40 billion dollars in spending over the next ten years these labs plan to use "advanced computers a thousand times faster than the computers currently in use today, together with expertise available in the weapons labs, past weapons test data, new experimental data from existing facilities, and new experimental data from soon to be constructed facilities to demonstrate the enhanced predictive capability necessary to support a stockpile stewardship program without testing".[16] Proponents of the CTBT

including the President of the United States are convinced that maintenance and modernization of the nuclear deterrent can be achieved under the auspices of the treaty.

American Leadership in the Next Millennium

Perhaps the most compelling argument for supporters of the CTBT is the impact to American leadership in the next millennium if the CTBT is not ratified and the NPT regime falls, as many believe it will. While it is hard to quantify such an impact most diplomats believe as Dr. Kenny does that, "Ratification is critical to the US efforts to maintain an effective role in maintaining and strengthening the nuclear non-proliferation regime, which is the principal constraint on testing by non-nuclear weapon states…the urgency for the US action derives not only because our leadership role will probably stimulate a wave of ratification's, including Russia and China, but also because it will give the United States a seat at a special conference that can be called after September 24th , 1999, to decide what measures can be taken to accelerate the ratification process and facilitate early entry into force of the treaty."[17] Proponents argue this is a prima facia case of good judgement. Idealists get a global non-proliferation treaty with American moral leadership intact and realists get the ability to continue to strengthen our deterrent relative to our adversaries.

Notes

[1] "The Comprehensive Test Ban treaty form a Global Perspective", Annette Schaper, Peace Research Institute Frankfurt, *Cornell Peace Program* Papers 21, Chapter 2, pg.2

[2] Ibid, pg. 1

[3] Ibid, pg. 8

[4] Ibid, pg. 8

[5] "Remarks on the Comprehensive Test Ban Treaty and Nuclear Non-Proliferation", Lawrence Scheinman, *Cornell Peace Program*, Papers 21, Chapter 4

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[6] "The Future of Nuclear Arms without testing", Richard L. Garwin, *Arms Control Today*, November/December 1997, pg. 3

[7] Ibid, pg. 4

[8] "Maybe this year, maybe not", John Isaacs, *Bulletin of Atomic Scientists*, May/Jun 1998, pg. 16

[9] "Challenges of Nuclear Stockpile Stewardship under a Comprehensive Test Ban", Harold P. Smith and Richard S. Soll, *Arms Control Today*, March 1998

[10] Ibid, Richard L Garwin, pg.4

[11] Ibid, Spurgeon M. Keeny, pg. 8

[12] Ibid, Richard S. Soll, pg. 2

[13] "Forensic Seismology supports the Comprehensive Test Ban treaty", John Zucca, Lawrence Livermore Laboratory papers, pg.2

[14] Ibid, pg. 7

[15] "Implications of the Comprehensive Test Ban Treaty for the United States Stockpile Stewardship and Management Program", Lawrence J. Ferderber, Lawrence Livermore National Laboratory, Cornell Peace Program, Paper 21, Chapter 4, pg. 2

[16] Ibid, pg. 6

[17] Ibid, Spurgeon Kenny, pg. 9

Chapter 3

Safety and Security, the Case against the CTBT

"Deterrence, unlike art, is not solely in the eyes of the beholder; it is also in the eye of the holder. Deterrence is as much dependent on the will and confidence of the deterrer as on the fear of the deterree. If the government were to lose confidence in the reliability and safety of its stockpile and if such loss of confidence were to become known, deterrence could vanish."[1]

—Harold P. Smith

This chapter will examine the case against the CTBT including the following: The treaty's relationship to the NPT, the effect on horizontal proliferation, the difficulty of its entry into force, the effect of no testing on the safety of nuclear stockpile, the difficulty of treaty verification, the problem of fusion weapons, and finally the impact to nuclear deterrence and American leadership.

The Failing of the NPT

The case against the CTBT is based in part on the weaknesses of the treaty itself; it does not save the failing NPT regime. Elimination of testing is not a step towards nuclear disarmament (in support of the NPT) as many believe. Scholars like Dr. Kathleen C. Bailey argue that for the foreseeable future nuclear deterrence will remain the backbone of national defense and lack of testing will not change that paradigm; it will just increase the danger associated with it: "NPT parties are discovering that the CTBT does not constitute a step towards disarmament as they thought it was. This is because the nuclear

weapon states are by no means abandoning nuclear deterrence but are instead taking steps to assure their stockpiles will remain safe and reliable and, therefore, usable despite the testing ban."[2] Dr Victor W Sidel, a member of the Conference on Disarmament and long time supporter of a comprehensive test ban, reluctantly agrees: "Without a real move by the Nuclear Weapon States (NWS) towards the abolition of nuclear weapons, the CTBT in its current form permits continued "vertical" proliferation by the NWS, helps maintain the NWS monopoly, is provocative to the nuclear have nots, and may actually intensify the nuclear arms race."[3] The linkage between the NPT and the CTBT that advocates of the treaty argue is so critical does not pass the common sense test as Dr Bailey explains: "It is the dependence of the Nuclear Weapon States on deterrence despite the NPT commitment to disarmament, that is the greatest source of danger to the non-proliferation treaty, and this conflict will persist regardless of whether the CTBT is ratified by the United States or not"[4] It is difficult to imagine, as opponents of the treaty point out, a world with no need for nuclear deterrence, given the posturing of many NWS including China and Russia. If the CTBT fails to create a meaningful link towards disarmament, that will be the least of its problems, according to realists.

The Effect on Horizontal Proliferation

While advocates of the CTBT take pride in the inherent beneficial effect on vertical proliferation, which realists may even grant them, the real problem in today's post cold war is not vertical proliferation, but horizontal. The CTBT does little or nothing to help prevent the creation of a relatively simple nuclear device by a rogue nation or its enemy. In fact the high-tech accuracy and sophistication of the nuclear weapons states arsenals is not likely to be repeated by emerging nations who see the multiple capability as well

beyond their needs. Testing is not required for the development of a more powerful Hiroshima type bomb as Dr. Kathleen C. Bailey, senior fellow at Lawrence Livermore Laboratory, points out in testimony to the United States Senate: "…the Hiroshima bomb and South Africa's arsenal were untested devices, furthermore, non-boosted, implosion type weapons may be designed with high confidence without testing. Testing is not as essential today as it was in the past for proliferating nations because the information related to nuclear weapons is now widespread."[5] Additionally, proliferating nations are not likely to be interested in the type of pin-point accuracy that hallmarked the arms race between the United States and Soviet Union, in fact, it may the opposite as Dr. Bailey again illustrates: "A premier objective (of the US and Russia) has been pinpoint strikes against small targets such as silos rather than cities. This dictated high performance delivery systems which in turn, required tight parameters on the allowable weight, size, shape, safety measures and yield. Now, by comparison proliferent nations are not likely to target silos. Instead they are likely to target cities. Their delivery vehicles may be ships, boats, trucks, or scud type missiles. Proliferators may not care whether the yield they obtain is exact…and are unlikely to have complex weapon designs."[6] In short, testing of nuclear weapons is not required for nations who want to acquire a basic nuclear deterrent. Even the most stoic supporters of the CTBT acknowledge this weakness.

Realists are quick to remind the nation that as Dr Garwin writes, the CTBT is no panacea for nuclear disarmament: "A CTB Treaty is only that—a ban on nuclear explosions of any yield exceeding zero; it is not a treaty by which nuclear weapon states agree to give up their nuclear weapons, reduce their numbers or even stop their

development."[7] Critics conclude that horizontal proliferation of crude first generation weapons is possible under the CTBT.

The Ratification Debacle and Requirement of Testing to Ensure Safety

The CTBT was opened for signature on 24 September 1996. To date 151 nations have signed the treaty but only 24 have ratified it.[8] More importantly, the treaty will enter into force only after the 44 nuclear capable states including India and Pakistan ratify it.[9] Currently, only ten nations of the 44 required have ratified the treaty, which must be entered into force by September 1999.[10] As will be discussed in the next chapter, the likelihood of India and Pakistan signing and ratifying the treaty in its current form are by all accounts, slim. As Senate Majority Leader Trent Lott argues, the CTBT's ratification debacle makes it even less palatable: "The nuclear spiral in South Asia demonstrates the irrelevance of U.S action on the [CTBT]. The CTBT will not enter into force unless 44 countries—including India and Pakistan—ratify it. That is not likely. Instead, it now appears likely that the administration's push for the CTBT actually accelerated the greatest proliferation disaster in decades: two new nuclear powers emerging in the last few weeks."[11] In short, opponents of the treaty argue that American ratification will have little effect on the treaty's ability to enter into force; that little effect weighed against the other disadvantages makes this treaty not worth the price.

As much as most conservative opponents love the Stockpile Stewardship and Management Program, the restrictions on testing the CTBT requires will effect the ability to modernize American weapons against emerging threats. The SSMP entails some risk as Dr Ferderber explains: "The risk in replacing nuclear testing with a science-based predictive capability lie not only in the risk that the science program will not be able to

develop reliable predictive tools, but also in the risk that we may become overconfident about our predictive ability. High confidence can be misplaced, especially in complex systems."[12] Even if the SSMP gives the predictive ability to maintain the stockpiles reliability many argue that will not guarantee an effective nuclear deterrent. As Dr. Bailey describes, there are essentially four main reasons why testing and modernization may be required as long as deterrence is the backbone of America's defense. "In one case, we might need to increase safety measures for our nuclear weapons. We cannot say what new technologies will be discovered in the future that would greatly enhance the safety of our nuclear weapons…Secondly, modernization may be needed for new requirements. There may be emerging threats… There may also be emerging defensive technologies. There may be a quantum leap somewhere in which Russia or some other nation may develop a technology that would render our weapons obsolete overnight. Finally, we would also need to adjust new delivery systems…What if there is a new discovery in the future that would enable us to have a more streamlined, lightweight, effective delivery system? If that is the case we may need a new warhead to go with it."[13] Empirically, testing has been required for the development of reliable and safe sophisticated warheads as demonstrated during the British moratorium on testing from 1965 to 1974. The advent of ballistic missile defense (BMD) changed the requirements of new warheads that would now have to withstand the possible impact of nuclear explosions. The British design of new warheads to counter the BMD threat was accomplished without testing under the moratorium.[14] As Dr. Soll describes, the British designs were not up to the mark: "U.S. weapon designers, who already had the benefit of testing warheads under conditions simulating the environment of nuclear BMD forces,

concluded that there were performance deficiencies in the British warhead design. The British database lacked the new and critical insight that American testing had provided during the British moratorium."[15] Testing should not be sacrificed on the altar of nuclear disarmament when America's shield and sword remains its nuclear deterrent. Even if the CTBT did not effect American capability, critics argue it would be impossible to enforce.

Test Detection and Verification

Under the zero yield CTBT, the issue is not what the yield of the explosion was, but if the explosion was nuclear. American scientists will go from measuring the yield of explosions under the Threshold Test Ban Treaty, which limits nuclear explosions to 150 kilotons to measuring every seismic movement to determine whether it was nuclear. Opponents of the test ban argue even if the full International Monitoring System is built as described previously, that it is simply impossible to have 100% detection and verification. As scientists from Lawrence Livermore Laboratory point out: "A nation attempting to conceal a test could attempt to minimize the seismic signals. Such signals from a small nuclear test could well be below magnitude 4 (Richter Scale), with resulting measurable signals traveling 1000 miles or less."[16] The real challenge of these militarily significant tests is that other techniques could be used to further reduce the seismic signature and chance of being caught. As Dr. Zucca explains: "…potential treaty violators might be tempted to detonate a nuclear device in the center of a large underground cavity, a technique called de-coupling. The seismic signal from such a test is reduced by a factor of up to 70 through a muffling effect that reduces the amplitude of the signal."[17] Given that the best IMS system is designed to register and catch all explosions in excess of 1 kiloton, opposing scientists argue that even if the system works

perfectly those explosions between 500 tons and 1 kiloton would be undetectable and are militarily significant. A recent case in point is India's round of tests detonated on May 13th. As Senator Jesse Helms, who holds ratification of the CTBT in his hands, explains "And, mind you there are aspects of India's nuclear detonations, which are extremely troubling. Today's two tests were clearly intended to fall below any seismic detection threshold, a clear indication that India intended to remain a nuclear power at all costs, which demonstrates India's intent to exploit the verification deficiencies of the CTBT by testing new designs in an undetectable fashion."[18] As technology progresses, testing yields will continue to fall as more and more information can be analyzed accurately. In fact, all three weapons laboratories of the United States initially requested testing to continue at the five hundred-ton level under the CTBT.[19] The bottom line for American security critics charge, is that violators might not be caught even under the best scenario, which would leave a country like the United States left behind the power curve on important technology and weapons application.

The Fusion Loophole and the Effect on Nuclear Deterrence

While most critics of the CTBT admit some general benefit to proliferation if the treaty could be entered into force, ardent realists point to perhaps the most important form of new vertical proliferation, fusion weapons, and highlight that the CTBT does not restrict their development. Fusion weapons are not for the light of heart. There is little chance most experts concede, of non-nuclear or nuclear threshold states going beyond the theory stage of these weapons, but with programs like the SSMP, fusion weapons could become a reality for those nations who pursue them. The National Ignition Facility to built under the auspices of the SSMP is for small laboratory controlled fusion

experiments, which the United States maintains is not covered under the test ban.[20] The problem of course is that the United States is not the only nation that can afford such development. If fusion weapons prove feasible, one report argues, "they could proliferate. Such weapons would be tempting to nations, because they could be very small or very large and relatively more lethal than existing thermo-nuclear weapons which must be triggered by a fission explosion."[21] So even though the United States plans to exploit the fusion loophole through the SSMP the relative level of vertical proliferation through fusion weapons remains unchanged by the CTBT.

The cumulative effect of the CTBT would weaken our nuclear deterrent. The United States has the most to lose since historically other nations have not honored previous testing moratoriums. Many hard line critics charge that the perception of declining confidence and reliability in our nuclear stockpile might lead other nations like Germany and Japan who rely on the American nuclear umbrella to re-visit their decision to stay non-nuclear.[22] Some nuclear abolitionists believe that this CTBT is actually a step backwards as Dr. Sidel argues: "The NWS have refused for three decades to set up any timetable for compliance with Article 6 of the Non-Proliferation Treaty (NPT), which calls for nuclear as well as general disarmament. Even after the world court in a unanimous advisory opinion in 1997 called on the NWS to move expeditiously toward fulfillment of their obligations under Article 6, the NWS have refused to make a timebound commitment. I have come to agree with India's long held position that a CTBT without a timebound framework for abolition may be a step backward."[23] The polarization of scientist's and academia on the CTBT is astounding, but on this issue at least both hard line realists and nuclear abolitionist's agree for different reasons that the

current CTBT will be a step backwards. The realist version of American leadership believes that it is simply too soon to commit to a timebound nuclear disarmament and that any suggestion that America is ready for that is misleading and dangerous. Better for friend and foe alike to understand American commitment to the nuclear deterrent, than for a costly misjudgment to occur which would test American resolve and capability. The loss of prestige associated with not ratifying the CTBT is not something leaders like Senator Jesse Helms are too concerned about: "India's actions demonstrate that the Comprehensive Test Ban Treaty, from a non-proliferation standpoint, is scarcely more than a sham."[24]

The case against the CTBT is based in historical realism and the effectiveness of arms control treaties. The recent proliferation of India and Pakistan is one that realists often cite as a case study in the failure of diplomacy, intelligence and arms control.

Notes

[1] Ibid, Harold P Smith, pg. 1
[2] Ibid, Kathleen C. Bailey, pg.10
[3] "Why Abolitionists should not support the CTBT in its current form", Victor W. Sidel, M.D., *The South Asian Bomb Forum*, pg. 2
[4] Ibid, Kathleen C. Bailey, pg.10
[5] "The CTB Treaty and Nuclear Non-Proliferation", Kathleen C. Bailey, testimony before the United States Senate, 18 March 1998, *Arms Control Today*, Mar/April 98, pg. 7
[6] Ibid, pg.10
[7] Ibid, Richard L. Garwin, pg. 5
[8] "Comprehensive Test Ban Treaty Signatories and Ratifiers", *Coalition to Reduce Nuclear Dangers*, Backgrounder , 19 Dec 98, pg. 1
[9] Ibid, pg. 1
[10] Ibid, pg. 4
[11] "Test Ban Treaty Irrelevant", Senator Trent Lott, *Senate Press Release*, 29 May 98
[12] Ibid, Lawrence J. Ferderber, pg. 2
[13] Ibid, Kathleen C. Bailey, pg. 11
[14] Ibid, Richard S. Soll, pg. 3
[15] Ibid, Richard S. Soll, pg. 3
[16] Ibid, John Zucca, pg.6

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[17] Ibid, pg. 10

[18] "Crisis in South Asia: India's nuclear tests", Senator Jesse Helms, Hearing, Foreign Relations Committee, 13 May 98

[19] Ibid, Kathleen C. Bailey, pg. 10

[20] "Science Group attacks Fusion Research efforts", *Chronicle of Higher Education*, 24 July 98, pg. A25

[21] Ibid, pg. A25

[22] Ibid, Kathleen C. Bailey, pg. 11

[23] Ibid, Victor W. Sidel, pg. 3

[24] "Test Ban Prospects Shaken", John Isaacs, *Bulletin of Atomic Scientists*, July/Aug 1998, pg. 40

Chapter 4

Nuclear Proliferation in South Asia and the CTBT

"In the event of war with India, Pakistan would use nuclear weapons at an early stage"

—President Ghulam Ishaq Khan-1990

On May 11th 1998, 24 years to the day after India's first nuclear explosion, the government of India tested three nuclear devices. On May 13th, despite tremendous international condemnation India tested two more devices including one claimed to be thermonuclear. The nation of Pakistan responded on May 30th with five atomic tests. Neither India nor Pakistan are signatories to the Non-Proliferation Treaty (NPT) or Comprehensive Test Ban Treaty (CTBT). This chapter will examine Indian nuclearization as an example of the effect of arms control and non-proliferation efforts and the challenges of verification.

Since the first test at Pokran, India, in 1974 India's public has had a long-standing fascination with exercising the nuclear option. As Dr. K Subramonyam, noted Indian policy analyst points out: "In this country there has been a consensus for India keeping the nuclear option open. The country's refusal to accede to the Non-Proliferation Treaty and the Comprehensive Test ban Treaty has had wide ranging support all across the political spectrum."[1] India's three wars with Pakistan and one with China have left the nation fully aware of the implications of going nuclear. While the economic cost to India

in the form of sanctions has been substantial, the loss of international leadership in the non-proliferation movement has been more qualitative as Daryl Kimbal, member of the Conference on Disarmament explains: "The Indian government's reckless nuclear blasts, in addition to raising regional tensions to new levels and provoking Pakistan to follow suit, have unfortunately undermined India's credibility and long standing leadership for nuclear disarmament. The tests also confirm early suspicion's that India's CTBT negotiating posture in 1996 was designed in part to avoid Indian participation in the CTBT and to leave India unconstrained to preserve its nuclear ambitions, which date back to the time of China's first nuclear test in 1964. Since its first nuclear blast in 1974, India has sought to maintain its "nuclear option"[2]. While critics like Mr. Kimball argue a nefarious motive for the testing, Indian scholars have articulated a contrarian paradigm, which rejects the view that the spread of nuclear weapons in South Asia is destabilizing. As former Indian Army Chief of Staff, Gen. Krishnaswami Sundarji explains, "A minimum nuclear deterrent will act as stabilizing factor. Pakistan will see it as counteracting India's superior conventional power potential and providing a more level playing field, making the chance of conventional war between the two countries less than before. As Kenneth N. Waltz puts it, 'conventional wars fought by countries that do not have nuclear weapons are likelier than conventional or nuclear wars fought by countries that have nuclear weapons.' "[3] Because India's nuclearization is based on minimum deterrence there is no need for an arms race just the "assured capability of a second strike that can inflict unacceptable damage."[4] This contrarian view that the spread of nuclear weapons can increase stability, rather than threaten international peace, put forward by Kenneth N. Waltz, as stable nuclear deterrence, flies in the face of CTBT advocates, who

believe that nuclear weapons are inherently de-stabilizing.[5] The consensus of academia in the region seem to believe that Gen. Sundaraji is correct, as Assad Durrani, director of Pakistan's Inter-Services Intelligence writes: "There were a number of crises that could have resulted in armed conflict between the two countries, but the specter of nuclearization checked the hostilities in their tracks."[6] What are the implications for the Comprehensive Test Ban Treaty? India's position appears to be pragmatic, with a 91% approval rating for the testing from its citizens, the government appears ready to enter negotiations now that the tests are complete.[7]

The completion of Indian nuclear testing on May 13th was seen as a failure of American influence in the non-proliferation regime. As described previously, the yields for the 13 May tests were below the detectable threshold level for a complete CTBT monitoring system (IMS). In fact the closest monitoring station to the tests, in Nilore, Pakistan about 700kms away picked up nothing.[8] Proponents rightly point out that the station in Nilore is not broad array sensor as envisioned by the IMS but a "stand-in" one, while conceding that the tests were below the planned verification range of 1 Kiloton.[9]

India's nuclearization reinforces the challenges associated with verifying a Comprehensive Test Ban and the limited influence America seems to have over South Asian regional stability. Since the CTBT does not prohibit preparation for a nuclear test, American influence and leadership in the non-proliferation regime proponents argue, is critical, if diplomatic initiatives to stop a perceived test are to be successful. The preponderance of evidence suggests however, that South Asia is sufficiently a-typical so as to warrant caution before generalizing from the lessons learned. Nuclearization of two adversaries within two weeks of each other may re-balance the region, but in most

situations around the globe, as with Iran or North Korea, proliferation has shown itself to have a destabilizing impact. It remains to be seen whether the nuclear India and Pakistan can now address the source of their conflict in Kashmir with greater fortitude and determination given the perceived increase in stability.

Persuading India and Pakistan to sign the Non-Proliferation Treaty as Nuclear weapon states or the CTBT will depend on America's position as the leader of the non-proliferation movement. A position sure to be lost if the United States does not ratify the CTBT which it led the world to create.

Notes

[1] "Nuclear India", K. Subramonyam, Indian Defence Review, 1998, pg. 8

[2] "Why the CTBT is Still an Essential Step Toward Nuclear Abolition", Daryl Kimball, The South Asian Bomb Forum, 1998, pg. 8

[3] Weapons of Mass Destruction, New Perspectives on Counterproliferation", K Sundarji, *Institute for National Strategic Studies*, 1995, pg. 55

[4] Ibid, pg. 60

[5] Kenneth N. Waltz, "The Spread of Nuclear Weapons: More May Be Better," *Adelphi Paper No. 171* (London: International Institute of Strategic Studies, 1981).

[6] "Nuclear Deterrence, tests and science in South Asia", Eric Arnett, Stockholm International Peace Research Institute, 1998, pg. 2

[7] "Terrible Mistake", James Bennet, *NY Times*, 14 May 98 and Ibid K. Subramonyam, pg. 18

[8] "The Paper Trail", Suzanne VanMoyland, *Bulletin of Atomic Scientists*, Jul/Aug 1998, pg. 26

[9] Ibid, pg.27

Chapter 5

The CTBT's impact on Non-Proliferation, and American Security

A careful cost/benefit analysis of the CTBT reveals that the Administration has made its case for the ratification. The linkage to the Non-Proliferation Treaty is universally perceived despite the very real reliance on nuclear deterrence that opponents point out. The problems with horizontal proliferation of first generation weapons that might occur under the CTBT are not unique to its ratification since the countries most likely to proliferate, like Iran and North Korea, will not be signatories, nor will they be after the type of weapons that testing is required for. In fact, ratification could decrease some horizontal proliferation and by no accounts would increase it, so some relative advantage is left to proponents of the treaty. Vertical proliferation may still occur under the less than stringent interpretation of the treaty the United States has indicated it will use. The treaty does make it less likely that the Nuclear Weapon States will deploy entirely new weapons but allows them to modernize non-nuclear components of current weapons, improving their effectiveness. The CTBT does not move the United States away from nuclear deterrence as a paradigm and is likely to impede other less materially rich nations in the search for more lethal and less costly weapons of mass destruction. The President's position on nuclear safety and reliability allows the United States to withdraw from the treaty and test weapons if necessary, which neutralizes the claim of opponents to

the treaty about the loss of confidence in the nuclear stockpile. The entry into force issue is not critical to the advantages America gains by ratifying the treaty. The overwhelming majority of nations in the world supports (158, as of last count) this treaty and will continue to support American leadership if the commitment to ratify is accomplished. Verifying a zero yield test ban will be extremely difficult, even with the entire CTBT International Monitoring System in place. Opponents of the treaty are correct about this difficulty, but what they fail to account for are the full intelligence capabilities of the United States complimenting the IMS system. The preponderance of evidence suggests that effective intelligence can help identify preparation for a nuclear test, as well as help verify one occurred. Site inspection technologies are also not part of the IMS and can provide definitive information.

In short, while each of the arguments against the CTBT has some merit the astute negotiation of this treaty has minimized their cumulative effect. The treaty continues the world on the path towards nuclear disarmament without significantly altering American capability.

The real contribution of ratifying the CTBT to American security is continued American leadership in the next millennium. With so many nations looking for the United States to lead the world into a nuclear free future, it would be difficult if not impossible, to abdicate the American position on this treaty and expect to lead on other vital issues where our nations security may be at stake. Realists have found a way to, if not to satisfy their concern, at least satiate it, through the Stockpile Stewardship and Management Program (SSMP). Hundreds of billions of dollars in programs to enhance and maintain our current nuclear stockpile, which even the most ardent hawk would

admit, is more than ample for the threats, America faces. The SSMP has been criticized as a concession to the hard liners, but as one Clinton official anonymously points out, it serves it purpose even to idealists, "This program isn't about safety and reliability, we know that. But most people here [in the administration] view it as the cost of the test ban. In order to get the treaty through congress we had to buy off the labs, we had to bribe them. It may be a Faustian bargain, but the dominant view here is it was politically necessary."[1] What the United States has done is negotiate a CTBT that has a minimal effect on its nuclear deterrent while still leading the rest of the world towards the long term Article VI NPT goal of total nuclear disarmament. The SSMP was a master stroke for the conservative realists and weapons laboratories; billions of dollars in material and equipment in exchange for supporting a treaty that may never enter into force, against a backdrop of political pressure that may have prevented testing even without the CTBT.

The agreement of the President to affirm the safety and reliability of American nuclear weapons as a supreme national interest under the treaty was another key event.[2] This clause combined with the SSMP and effect on the non-proliferation regime makes CTBT ratification an imperative. Leadership does have a price. The perception of America as unwilling to constrain testing and development can only reinforce the stereotypical view of the United States as the world's bully, demanding from others what it itself is unwilling to commit to. The discriminatory nature of the NPT has been successfully manipulated by countries like India against the United States in the international community. This view of the United States as a hypocrite, calling for non-proliferation from all other states while continuing testing to improve it own arsenal, has gained momentum since the fall of the Soviet Union. Ratifying the Comprehensive Test

Ban Treaty with full funding for the Stockpile Stewardship and Management Program allows the United States to maintain the strength and capability of its nuclear deterrent, while imploring nations without such hi-tech capability to adhere and abide by the treaties letter and intent. In addition, political support for approving the CTBT has remained above 70% for over four decades.[3]

The price of not ratifying the Comprehensive Test Ban Treaty would be the loss of American leadership and moral authority in the non-proliferation regime. Perhaps the only point of agreement between idealists and realists in arms control is the importance of American influence. While they have diverging paths to achieve it, there is universal acceptance of its importance. The evolution of nuclear weapons and non-proliferation has been a hallmark of America's superpower status and influence. The loss of the bully pulpit this moral authority provides would create a vacuum sure to be filled by an aspiring superpower whose values and priorities maybe different than America's. The United States global interests and alliances make this loss an unacceptable price for the perceived disadvantages of a treaty whose time has come. A failure to ratify may well make the United States the eagle, to whom Aeschlyus refers, "*with our own feathers, not by others hands, are we now smitten*."

Notes

[1] "Virtual Nukes, when a test is not a test", Bill Masler, The Nation, Jun 15/22, pg. 18

[2] Ibid, Harold P. Smith and Richard S. Soll, pg. 1

[3] Ibid, John Isaacs, pg. 17

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